What is claimed is:

1. A cardiac assist system, comprising:

a primary device housing;

said primary device housing having a control circuit therein;

a shielding formed around said primary device housing to shield said primary device housing and any circuits therein from electromagnetic interference; and

a lead system to transmit and receive signals between a heart and said primary device housing.

2. The cardiac assist system as claimed in claim 1, wherein said shielding is a metallic sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

3. The cardiac assist system as claimed in claim 1, wherein said shielding is a carbon composite sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

4. The cardiac assist system as claimed in claim 1, wherein said shielding is a polymer composite sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

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5. The cardiac assist system as claimed in claim 1, wherein said lead system comprises a fiber optic based communication system.

6. The cardiac assist system as claimed in claim 5, wherein said fiber optic communication system contains at least one channel within a multi-fiber optic bundle.

8. The cardiac assist system as claimed in claim 5, wherein said fiber optic communication system is coated with electromagnetic interference resistant material.

10. The cardiac assist system as claimed in claim 6, wherein said multi-fiber optic bundle is coated with electromagnetic interference resistant material.

11. The cardiac assist system as claimed in claim 1, wherein said lead system comprises a plurality of electrical leads.

12. The cardiac assist system as claimed in claim 11, wherein said plurality of electrical leads have a second shielding therearound, said second shielding preventing said electrical leads from conducting stray electromagnetic interference.

13. The cardiac assist system as claimed in claim 12, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

14. The cardiac assist system as claimed in claim 12, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

15. The cardiac assist system as claimed in claim 12, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

16. The cardiac assist system as claimed in claim 11, wherein an electrode located on an end of said electrical lead has an anti-antenna geometrical shape, said anti-antenna geometrical shape preventing said electrode from picking up and conducting stray electromagnetic interference.

17. The cardiac assist system as claimed in claim 16, wherein said plurality of electrical leads have a second shielding therearound, said second shielding preventing said electrical leads from conducting stray electromagnetic interference.

18. The cardiac assist system as claimed in claim 17, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

19. The cardiac assist system as claimed in claim 17, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

20. The cardiac assist system as claimed in claim 17, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

21. The cardiac assist system as claimed in claim 11, wherein each electrical lead includes an electrical filter, said electrical filter removing stray electromagnetic interference from a signal being received from said electrical lead.

22. The cardiac assist system as claimed in claim 21, wherein said plurality of electrical leads have a second shielding therearound, said second shielding preventing said electrical leads from conducting stray electromagnetic interference.

23. The cardiac assist system as claimed in claim 22, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

24. The cardiac assist system as claimed in claim 22, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

25. The cardiac assist system as claimed in claim 22, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

26. The cardiac assist system as claimed in claim 1, wherein said shielding is covered with a biocompatible material.

27. The cardiac assist system as claimed in claim 5, wherein said fiber optic based communication system is covered with a biocompatible material.

28. The cardiac assist system as claimed in claim 6, wherein said multi-fiber optic bundle is covered with a biocompatible material.

29. The cardiac assist system as claimed in claim 11, wherein said electrical leads are covered with a biocompatible material.

30. The cardiac assist system as claimed in claim 12, wherein said second shielding is covered with a biocompatible material.

31. The cardiac assist system as claimed in claim 16, wherein said electrical leads are covered with a biocompatible material.

32. The cardiac assist system as claimed in claim 17, wherein said second shielding is covered with a biocompatible material.

33. The cardiac assist system as claimed in claim 21, wherein said electrical leads are covered with a biocompatible material.

34. The cardiac assist system as claimed in claim 22, wherein said second shielding is covered with a biocompatible material.

35. The cardiac assist system as claimed in claim 26, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

36. The cardiac assist system as claimed in claim 27, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

37. The cardiac assist system as claimed in claim 28, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

38. The cardiac assist system as claimed in claim 29, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

39. The cardiac assist system as claimed in claim 30, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

40. The cardiac assist system as claimed in claim 31, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

41. The cardiac assist system as claimed in claim 32, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

42. The cardiac assist system as claimed in claim 33, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

43. The cardiac assist system as claimed in claim 34, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

44. The cardiac assist system as claimed in claim 1, wherein said primary device housing includes a microprocessor integrated circuit for controlling the operations of the cardiac assist system.

45. The cardiac assist system as claimed in claim 44, wherein said primary device housing includes circuitry to detect and isolate cross talk between device pulsing operations and device sensing operations.

46. The cardiac assist system as claimed in claim 44, wherein said microprocessor integrated selecting a mode of operation for the cardiac assist system based on predetermined sensed parameters.

47. The cardiac assist system as claimed in claim 1, further comprising a battery power source and a battery power source measuring circuit;

said microprocessor integrated circuit automatically adjusting a value for determining an elective replacement indication condition of a battery power source such that the value is automatically adjusted by said microprocessor integrated circuit in response to a measured level of a state of said battery power source, the measured level generated by said battery power source measuring circuit connected to said battery power source.

48. The cardiac assist system as claimed in claim 44, wherein said microprocessor integrated circuit isolates physiological signals using a noise filtering circuit.

49. The cardiac assist system as claimed in claim 44, wherein said microprocessor integrated circuit isolates physiological signals using digital noise filtering.

50. The cardiac assist system as claimed in claim 44, wherein the cardiac assist system is implantable and said microprocessor integrated circuit is programmable from a source external of the cardiac assist system.

51. The cardiac assist system as claimed in claim 44, wherein the cardiac assist system is implantable and said microprocessor integrated circuit provides physiological diagnostics to a source external of the cardiac assist system.

52. The cardiac assist system as claimed in claim 44, wherein the cardiac assist system is implantable and said microprocessor integrated circuit provides circuit diagnostics to a source external of the cardiac assist system.

53. The cardiac assist system as claimed in claim 44, wherein the cardiac assist system is implantable and said microprocessor integrated circuit is programmable from a source external of the cardiac assist system and provides circuit diagnostics to a source external of the cardiac assist system.

54. The cardiac assist system as claimed in claim 11, wherein said electrical leads are unipolar leads.

55. The cardiac assist system as claimed in claim 11, wherein said electrical leads are bipolar leads.

56. The cardiac assist system as claimed in claim 11, wherein said electrical leads are a combination of unipolar and bipolar leads.

57. The cardiac assist system as claimed in claim 1, wherein said leads system is a combination of a fiber optic based communication system and electrical leads.

58. The cardiac assist system as claimed in claim 57, wherein said electrical leads are unipolar leads.

59. The cardiac assist system as claimed in claim 57, wherein said electrical leads are bipolar leads.

60. The cardiac assist system as claimed in claim 57, wherein said electrical leads are a combination of unipolar and bipolar leads.

61. The cardiac assist system as claimed in claim 57, wherein said fiber optic communication system contains at least one channel within a multi-fiber optic bundle.

62. The cardiac assist system as claimed in claim 61, wherein said electrical leads are unipolar leads.

63. The cardiac assist system as claimed in claim 61, wherein said electrical leads are bipolar leads.

64. The cardiac assist system as claimed in claim 61, wherein said electrical leads are a combination of unipolar and bipolar leads.

65. The cardiac assist system as claimed in claim 1, wherein said lead system includes a sensing and stimulation system at an epicardial-lead interface with a desired anatomical cardiac tissue region.

66. The cardiac assist system as claimed in claim 65, wherein said sensing and stimulation system includes optical sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

67. The cardiac assist system as claimed in claim 65, wherein said sensing and stimulation system includes optical sensing components to detect physiological signals from the desired anatomical cardiac tissue region and electrical sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

68. The cardiac assist system as claimed in claim 65, wherein said sensing and stimulation system includes electrical sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

69. The cardiac assist system as claimed in claim 65, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

70. The cardiac assist system as claimed in claim 66, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

71. The cardiac assist system as claimed in claim 67, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

72. The cardiac assist system as claimed in claim 68, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

73. The cardiac assist system as claimed in claim 65, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

74. The cardiac assist system as claimed in claim 66, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

75. The cardiac assist system as claimed in claim 67, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

76. The cardiac assist system as claimed in claim 68, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

77. The cardiac assist system as claimed in claim 65, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region and electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

78. The cardiac assist system as claimed in claim 66, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region and electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

79. The cardiac assist system as claimed in claim 67, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region and electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

80. The cardiac assist system as claimed in claim 68, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region and electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

81. The cardiac assist system as claimed in claim 1, further comprising:

a detection circuit to detect a phase timing of an external electromagnetic field;

said control circuit altering its operations to avoid interfering with the detected external electromagnetic field.

82. The cardiac assist system as claimed in claim 1, further comprising:

sensors to detect a heart signal and to produce a sensor signal therefrom; and

a modulator to modulate said sensor signal to differentiate said sensor signal from electromagnetic interference.

83. The cardiac assist system as claimed in claim 1, further comprising:

sensors to detect a heart signal and to produce a sensor signal therefrom; and

a sampling circuit to sample said sensor signal multiple times to differentiate said sensor signal from electromagnetic interference, undesirable acoustic signals, large muscle contractions, or extraneous infrared light.

84. The cardiac assist system as claimed in claim 21, wherein said electrical filter comprises capacitive and inductive filter elements adapted to filter out predetermined frequencies of electromagnetic interference.

85. The cardiac assist system as claimed in claim 48, wherein said noise filtering circuit comprises capacitive and inductive filter elements adapted to filter out predetermined frequencies of electromagnetic interference.

86. The cardiac assist system as claimed in claim 65, wherein said sensing and stimulation system includes hydrostatic pressure sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

87. A cardiac assist system, comprising:

a primary device housing;

said primary device housing having a control circuit therein;

a lead system to transmit and receive signals between a heart and said primary device housing; and

a detection circuit, located in said primary device housing, to detect an electromagnetic interference insult upon the cardiac assist system;

said control circuit placing the cardiac assist system in an asynchronous mode upon detection of the electromagnetic interference insult by said detection system.

88. The cardiac assist system as claimed in claim 87, further comprising:

a shielding formed around said primary device housing to shield said primary device housing and any circuits therein from electromagnetic interference.

89. The cardiac assist system as claimed in claim 88, wherein said shielding is a metallic sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

90. The cardiac assist system as claimed in claim 88, wherein said shielding is a carbon composite sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

91. The cardiac assist system as claimed in claim 88, wherein said shielding is a polymer composite sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

92. The cardiac assist system as claimed in claim 88, wherein said lead system comprises a fiber optic based communication system.

93. The cardiac assist system as claimed in claim 92, wherein said fiber optic communication system contains at least one channel within a multi-fiber optic bundle.

94. The cardiac assist system as claimed in claim 92, wherein said fiber optic communication system is coated with electromagnetic interference resistant material.

95. The cardiac assist system as claimed in claim 93, wherein said multi-fiber optic bundle is coated with electromagnetic interference resistant material.

96. The cardiac assist system as claimed in claim 88, wherein said lead system comprises a plurality of electrical leads.

97. The cardiac assist system as claimed in claim 96, wherein said plurality of electrical leads have a second shielding therearound, said second shielding preventing said electrical leads from conducting stray electromagnetic interference.

98. The cardiac assist system as claimed in claim 97, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

99. The cardiac assist system as claimed in claim 97, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

100. The cardiac assist system as claimed in claim 97, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

101. The cardiac assist system as claimed in claim 96, wherein an electrode located on an end of said electrical lead has an anti-antenna geometrical shape, said anti-antenna geometrical shape preventing said electrode from picking up and conducting stray electromagnetic interference.

102. The cardiac assist system as claimed in claim 101, wherein said plurality of electrical leads have a second shielding therearound, said second shielding preventing said electrical leads from conducting stray electromagnetic interference.

103. The cardiac assist system as claimed in claim 102, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

104. The cardiac assist system as claimed in claim 102, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

105. The cardiac assist system as claimed in claim 102, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

106. The cardiac assist system as claimed in claim 96, wherein each electrical lead includes an electrical filter, said electrical filter removing stray electromagnetic interference from a signal being received from said electrical lead.

107. The cardiac assist system as claimed in claim 106, wherein said plurality of electrical leads have a second shielding therearound, said second shielding preventing said electrical leads from conducting stray electromagnetic interference.

108. The cardiac assist system as claimed in claim 107, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

109. The cardiac assist system as claimed in claim 107, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

110. The cardiac assist system as claimed in claim 107, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

111. The cardiac assist system as claimed in claim 88, wherein said shielding is covered with a biocompatible material.

112. The cardiac assist system as claimed in claim 94, wherein said fiber optic based communication system is covered with a biocompatible material.

113. The cardiac assist system as claimed in claim 91, wherein said multi-fiber optic bundle is covered with a biocompatible material.

114. The cardiac assist system as claimed in claim 96, wherein said electrical leads are covered with a biocompatible material.

115. The cardiac assist system as claimed in claim 97, wherein said second shielding is covered with a biocompatible material.

116. The cardiac assist system as claimed in claim 101, wherein said electrical leads are covered with a biocompatible material.

117. The cardiac assist system as claimed in claim 102, wherein said second shielding is covered with a biocompatible material.

118. The cardiac assist system as claimed in claim 106, wherein said electrical leads are covered with a biocompatible material.

119. The cardiac assist system as claimed in claim 107, wherein said second shielding is covered with a biocompatible material.

120. The cardiac assist system as claimed in claim 111, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

121. The cardiac assist system as claimed in claim 112, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

122. The cardiac assist system as claimed in claim 113, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

123. The cardiac assist system as claimed in claim 114, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

124. The cardiac assist system as claimed in claim 115, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

125. The cardiac assist system as claimed in claim 116, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

126. The cardiac assist system as claimed in claim 117, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

127. The cardiac assist system as claimed in claim 118, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

128. The cardiac assist system as claimed in claim 119, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

129. The cardiac assist system as claimed in claim 88, wherein said primary device housing includes a microprocessor integrated circuit for controlling the operations of the cardiac assist system.

130. The cardiac assist system as claimed in claim 129, wherein said primary device housing includes circuitry to detect and isolate cross talk between device pulsing operations and device sensing operations.

131. The cardiac assist system as claimed in claim 129, wherein said microprocessor integrated selecting a mode of operation for the cardiac assist system based on predetermined sensed parameters.

132. The cardiac assist system as claimed in claim 88, further comprising a battery power source and a battery power source measuring circuit;

said microprocessor integrated circuit automatically adjusting a value for determining an elective replacement indication condition of a battery power source such that the value is automatically adjusted by said microprocessor integrated circuit in response to a measured level of a state of said battery power source, the measured level generated by said battery power source measuring circuit connected to said battery power source.

133. The cardiac assist system as claimed in claim 129, wherein said microprocessor integrated circuit isolates physiological signals using a noise filtering circuit.

134. The cardiac assist system as claimed in claim 129, wherein said microprocessor integrated circuit isolates physiological signals using digital noise filtering.

135. The cardiac assist system as claimed in claim 129, wherein the cardiac assist system is implantable and said microprocessor integrated circuit is programmable from a source external of the cardiac assist system.

136. The cardiac assist system as claimed in claim 129, wherein the cardiac assist system is implantable and said microprocessor integrated circuit provides physiological diagnostics to a source external of the cardiac assist system.

137. The cardiac assist system as claimed in claim 129, wherein the cardiac assist system is implantable and said microprocessor integrated circuit provides circuit diagnostics to a source external of the cardiac assist system.

138. The cardiac assist system as claimed in claim 129, wherein the cardiac assist system is implantable and said microprocessor integrated circuit is programmable from a source external of the cardiac assist system and provides circuit diagnostics to a source external of the cardiac assist system.

139. The cardiac assist system as claimed in claim 96, wherein said electrical leads are unipolar leads.

140. The cardiac assist system as claimed in claim 96, wherein said electrical leads are bipolar leads.

141. The cardiac assist system as claimed in claim 96, wherein said electrical leads are a combination of unipolar and bipolar leads.

142. The cardiac assist system as claimed in claim 88, wherein said leads system is a combination of a fiber optic based communication system and electrical leads.

143. The cardiac assist system as claimed in claim 142, wherein said electrical leads are unipolar leads.

144. The cardiac assist system as claimed in claim 142, wherein said electrical leads are bipolar leads.

145. The cardiac assist system as claimed in claim 142, wherein said electrical leads are a combination of unipolar and bipolar leads.

146. The cardiac assist system as claimed in claim 142, wherein said fiber optic communication system contains at least one channel within a multi-fiber optic bundle.

147. The cardiac assist system as claimed in claim 146, wherein said electrical leads are unipolar leads.

148. The cardiac assist system as claimed in claim 146, wherein said electrical leads are bipolar leads.

149. The cardiac assist system as claimed in claim 146, wherein said electrical leads are a combination of unipolar and bipolar leads.

150. The cardiac assist system as claimed in claim 88, wherein said lead system includes a sensing and stimulation system at an epicardial-lead interface with a desired anatomical cardiac tissue region.

151. The cardiac assist system as claimed in claim 150, wherein said sensing and stimulation system includes optical sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

152. The cardiac assist system as claimed in claim 150, wherein said sensing and stimulation system includes optical sensing components to detect physiological signals from the desired anatomical cardiac tissue region and electrical sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

153. The cardiac assist system as claimed in claim 150, wherein said sensing and stimulation system includes electrical sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

154. The cardiac assist system as claimed in claim 150, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

155. The cardiac assist system as claimed in claim 151, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

156. The cardiac assist system as claimed in claim 152, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

157. The cardiac assist system as claimed in claim 153, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

158. The cardiac assist system as claimed in claim 150, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

159. The cardiac assist system as claimed in claim 151, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

160. The cardiac assist system as claimed in claim 152, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

161. The cardiac assist system as claimed in claim 153, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

162. The cardiac assist system as claimed in claim 150, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region and electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

163. The cardiac assist system as claimed in claim 151, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region and electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

164. The cardiac assist system as claimed in claim 152, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region and electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

165. The cardiac assist system as claimed in claim 153, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region and electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

166. The cardiac assist system as claimed in claim 87, wherein said control circuit places the cardiac assist system in the asynchronous mode for a duration of the electromagnetic interference insult and places the cardiac assist system in a synchronous mode upon detection of an absence of an electromagnetic interference insult by said detection system.

167. The cardiac assist system as claimed in claim 87, wherein said detection circuit is a thermistor heat detector.

168. The cardiac assist system as claimed in claim 87, wherein said detection circuit is a high frequency interference detector.

169. The cardiac assist system as claimed in claim 87, wherein said detection circuit is a high voltage detector.

170. The cardiac assist system as claimed in claim 87, wherein said detection circuit is an excess current detector.

171. The cardiac assist system as claimed in claim 106, wherein said electrical filter comprises capacitive and inductive filter elements adapted to filter out predetermined frequencies of electromagnetic interference.

172. The cardiac assist system as claimed in claim 131, wherein said noise filtering circuit comprises capacitive and inductive filter elements adapted to filter out predetermined frequencies of electromagnetic interference.

173. The cardiac assist system as claimed in claim 150, wherein said sensing and stimulation system includes hydrostatic pressure sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

174. A cardiac assist system, comprising:

a primary device housing;

said primary device housing having a control circuit therein;

a shielding formed around said primary device housing to shield said primary device housing and any circuits therein from electromagnetic interference;

an fiber optic based lead system to receive signals at said primary housing from a heart; and

an electrical based lead system to transmit signals to the heart from said primary device housing.

175. The cardiac assist system as claimed in claim 174, wherein said shielding is a metallic sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

176. The cardiac assist system as claimed in claim 174, wherein said shielding is a carbon composite sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

177. The cardiac assist system as claimed in claim 174, wherein said shielding is a polymer composite sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

178. The cardiac assist system as claimed in claim 174, wherein said fiber optic based lead system contains at least one channel within a multi-fiber optic bundle.

179. The cardiac assist system as claimed in claim 174, wherein said fiber optic based lead system is coated with electromagnetic interference resistant material.

180. The cardiac assist system as claimed in claim 178, wherein said multi-fiber optic bundle is coated with electromagnetic interference resistant material.

181. The cardiac assist system as claimed in claim 174, wherein said electrical based lead system comprises a plurality of electrical leads.

182. The cardiac assist system as claimed in claim 181, wherein said plurality of electrical leads have a second shielding therearound, said second shielding preventing said electrical leads from conducting stray electromagnetic interference.

183. The cardiac assist system as claimed in claim 182, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

184. The cardiac assist system as claimed in claim 182, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

185. The cardiac assist system as claimed in claim 182, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

186. The cardiac assist system as claimed in claim 181, wherein an electrode located on an end of said electrical lead has an anti-antenna geometrical shape, said anti-antenna geometrical shape preventing said electrode from picking up and conducting stray electromagnetic interference.

187. The cardiac assist system as claimed in claim 186, wherein said plurality of electrical leads have a second shielding therearound, said second

shielding preventing said electrical leads from conducting stray electromagnetic interference.

188. The cardiac assist system as claimed in claim 187, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

189. The cardiac assist system as claimed in claim 187, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

190. The cardiac assist system as claimed in claim 187, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

191. The cardiac assist system as claimed in claim 181, wherein each electrical lead includes an electrical filter, said electrical filter removing stray electromagnetic interference from a signal being received from said electrical lead.

192. The cardiac assist system as claimed in claim 191, wherein said electrical filter comprises capacitive and inductive filter elements adapted to filter out predetermined frequencies of electromagnetic interference.

193. The cardiac assist system as claimed in claim 191, wherein said plurality of electrical leads have a second shielding therearound, said second

shielding preventing said electrical leads from conducting stray electromagnetic interference.

194. The cardiac assist system as claimed in claim 193, wherein said second shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

195. The cardiac assist system as claimed in claim 193, wherein said second shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

196. The cardiac assist system as claimed in claim 193, wherein said second shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

197. The cardiac assist system as claimed in claim 174, wherein said shielding is covered with a biocompatible material.

198. The cardiac assist system as claimed in claim 174, wherein said fiber optic based lead system is covered with a biocompatible material.

199. The cardiac assist system as claimed in claim 178, wherein said multi-fiber optic bundle is covered with a biocompatible material.

200. The cardiac assist system as claimed in claim 181, wherein said electrical leads are covered with a biocompatible material.

201. The cardiac assist system as claimed in claim 182, wherein said second shielding is covered with a biocompatible material.

202. The cardiac assist system as claimed in claim 186, wherein said electrical leads are covered with a biocompatible material.

203. The cardiac assist system as claimed in claim 187, wherein said second shielding is covered with a biocompatible material.

204. The cardiac assist system as claimed in claim 191, wherein said electrical leads are covered with a biocompatible material.

205. The cardiac assist system as claimed in claim 193, wherein said second shielding is covered with a biocompatible material.

206. The cardiac assist system as claimed in claim 197, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

207. The cardiac assist system as claimed in claim 198, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

208. The cardiac assist system as claimed in claim 199, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

209. The cardiac assist system as claimed in claim 200, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

210. The cardiac assist system as claimed in claim 201, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

211. The cardiac assist system as claimed in claim 202, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

212. The cardiac assist system as claimed in claim 203, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

213. The cardiac assist system as claimed in claim 204, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

214. The cardiac assist system as claimed in claim 205, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

215. The cardiac assist system as claimed in claim 181, wherein said electrical leads are unipolar leads.

216. The cardiac assist system as claimed in claim 181, wherein said electrical leads are bipolar leads.

217. The cardiac assist system as claimed in claim 181, wherein said electrical leads are a combination of unipolar and bipolar leads.

218. The cardiac assist system as claimed in claim 174, wherein said fiber optic based lead system includes a sensing and stimulation system at an epicardial-lead interface with a desired anatomical cardiac tissue region.

219. The cardiac assist system as claimed in claim 218, wherein said sensing and stimulation system includes hydrostatic pressure sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

220. The cardiac assist system as claimed in claim 218, wherein said sensing and stimulation system includes optical sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

221. The cardiac assist system as claimed in claim 218, wherein said sensing and stimulation system includes electrical sensing components to detect physiological signals from the desired anatomical cardiac tissue region and electro-optical converting devices to convert the detected electrical signals to optical signals.

222. The cardiac assist system as claimed in claim 220, wherein said optical sensing components detect physiological signals by measuring a displacement of a mirror.

223. The cardiac assist system as claimed in claim 220, wherein said optical sensing components detect physiological signals by measuring a change in a refractive index of a section of cladding.

224. The cardiac assist system as claimed in claim 220, wherein said optical sensing component is an optical strain gauge to detect physiological signals.

225. The cardiac assist system as claimed in claim 220, wherein said optical sensing component is an optical-pressure sensor to detect physiological signals.

226. The cardiac assist system as claimed in claim 225, wherein said optical-pressure sensor includes a hollow porous sheath.

227. The cardiac assist system as claimed in claim 174, wherein said electrical based lead system includes a sensing and stimulation system at an epicardial-lead interface with a desired anatomical cardiac tissue region.

228. The cardiac assist system as claimed in claim 227, wherein said sensing and stimulation system includes electrical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

229. A cardiac assist system, comprising:

a primary device housing;

said primary device housing having a control circuit therein;

a shielding formed around said primary device housing to shield said primary device housing and any circuits therein from electromagnetic interference; and

a fiber optic based lead system to receive signals at said primary housing from a heart and to transmit signals to the heart from said primary device housing.

230. The cardiac assist system as claimed in claim 229, wherein said primary device housing further includes an electronic signal generator and a controlled laser light pulse generator linked to said electronic signal generator;

said fiber optic based lead system including,

a fiber optic light pipe for receiving the laser light pulse from said controlled laser light pulse generator at a proximal end of said fiber optic light pipe,

a photodiode, at a distal end of said fiber optic light pipe, to convert the laser light pulse back into an electrical pulse, and

electrically driven cardiac electrodes coupled to said photodiode and to a cardiac muscle.

231. The cardiac assist system as claimed in claim 229, wherein said shielding is a metallic sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

232. The cardiac assist system as claimed in claim 229, wherein said shielding is a carbon composite sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

233. The cardiac assist system as claimed in claim 229, wherein said shielding is a polymer composite sheath to shield said primary device housing and any circuits therein from electromagnetic interference.

234. The cardiac assist system as claimed in claim 229, wherein said fiber optic based lead system contains at least one channel within a multi-fiber optic bundle.

235. The cardiac assist system as claimed in claim 229, wherein said fiber optic based lead system is coated with electromagnetic interference resistant material.

236. The cardiac assist system as claimed in claim 234, wherein said multi-fiber optic bundle is coated with electromagnetic interference resistant material.

237. The cardiac assist system as claimed in claim 229, wherein said shielding is covered with a biocompatible material.

238. The cardiac assist system as claimed in claim 229, wherein said fiber optic based lead system is covered with a biocompatible material.

239. The cardiac assist system as claimed in claim 234, wherein said multi-fiber optic bundle is covered with a biocompatible material.

240. The cardiac assist system as claimed in claim 237, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

241. The cardiac assist system as claimed in claim 238, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

242. The cardiac assist system as claimed in claim 239, wherein said biocompatible material is a non-permeable diffusion resistant biocompatible material.

243. The cardiac assist system as claimed in claim 229, wherein said fiber optic based lead system includes a sensing and stimulation system at an epicardial-lead interface with a desired anatomical cardiac tissue region.

244. The cardiac assist system as claimed in claim 243, wherein said sensing and stimulation system includes hydrostatic pressure sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

245. The cardiac assist system as claimed in claim 243, wherein said sensing and stimulation system includes optical sensing components to detect physiological signals from the desired anatomical cardiac tissue region.

246. The cardiac assist system as claimed in claim 243, wherein said sensing and stimulation system includes electrical sensing components to detect physiological signals from the desired anatomical cardiac tissue region and electro-optical converting devices to convert the detected electrical signals to optical signals.

247. The cardiac assist system as claimed in claim 245, wherein said optical sensing components detect physiological signals by measuring a displacement of a mirror.

248. The cardiac assist system as claimed in claim 245, wherein said optical sensing components detect physiological signals by measuring a change in a refractive index of a section of cladding.

249. The cardiac assist system as claimed in claim 245, wherein said optical sensing component is an optical strain gauge to detect physiological signals.

250. The cardiac assist system as claimed in claim 245, wherein said optical sensing component is an optical-pressure sensor to detect physiological signals.

251. The cardiac assist system as claimed in claim 250, wherein said optical-pressure sensor includes a hollow porous sheath.

252. The cardiac assist system as claimed in claim 243, wherein said sensing and stimulation system includes optical pulsing components to deliver a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

253. The cardiac assist system as claimed in claim 252, wherein said optical pulsing components include an opto-electrical circuit for converting a

light signal into an electrical signal, said electrical signal being delivered as a stimulus of a predetermined duration and power to the desired anatomical cardiac tissue region.

254. A cardiac assist system for implanting in a body of a patient, the cardiac assist system comprising:

a main module;

a magnetic-resonance imaging-immune auxiliary module;

a communication channel between said main module and said magnetic-resonance imaging-immune auxiliary module for said magnetic-resonance imaging-immune auxiliary module to detect failure of said main module; and

a controller for activating said magnetic-resonance imaging-immune auxiliary module upon detection of failure of said main module.

255. A cardiac assist system, comprising:

a primary device housing including a power supply and a light source; said primary device housing having a control circuit therein;

a shielding formed around said primary device housing to shield said primary device housing and any circuits therein from electromagnetic interference;

a cardiac assist device associated with a heart; and

a photonic lead system to transmit between said primary device housing and the cardiac assist device, both power and control signals in the form of light.

256. The cardiac assist system of claim 255, wherein said cardiac assist device includes:

a photoresponsive device for converting the light transmitted by the photonic lead system into electrical energy, and for sensing variations in the light energy to produce control signals;

a charge accumulating device for receiving and storing the electrical energy produced by the photoresponsive device; and

a discharge control device, responsive to the control signals, for directing the stored electrical energy from the charge accumulating device to the cardiac assist device associated with the heart.

257. The cardiac assist system as claimed in claim 256, wherein said photoresponsive device is a small surface area photodiode and a large surface area photodiode, said small surface area photodiode sensing variations in the light energy to produce control signals, said large surface area photodiode converting the light transmitted by said photonic lead system into electrical energy.

258. The cardiac assist system as claimed in claim 256, wherein said photoresponsive device is an array of photodiodes having a first section of photodiodes and a second section of photodiodes, said first section of photodiodes sensing variations in the light energy to produce control signals, said second section of photodiodes converting the light transmitted by said photonic lead system into electrical energy.

259. The cardiac assist system as claimed in claim 256, wherein said photoresponsive device includes a charge transfer control circuit and a photodiode, said charge transfer control circuit controlling a discharging of a photodiode capacitance in two separate discharge periods during an integration period of the photodiode such that a first discharge period of the photodiode capacitance provides the sensing of variations in the light energy to produce control signals and a second discharge period of the photodiode capacitance provides the converting the light transmitted by said photonic lead system into electrical energy.

260. The cardiac assist system as claimed in claim 259, wherein the first discharge period is completed before the second discharge period.

261. The cardiac assist system as claimed in claim 259, wherein the first discharge period is a shorter time duration that the time duration of the second discharge period.

262. The cardiac assist system as claimed in claim 259, wherein the integration period corresponds to the sampling period of the light to derive control data.

263. The cardiac assist system as claimed in claim 259, wherein during the first discharge period, a control signal sensing circuit is connected to said photodiode, and during the second discharge period, said charge accumulating device is connected to said photodiode.

264. The cardiac assist system as claimed in claim 256, wherein said charge accumulating device is a capacitor.

265. The cardiac assist system as claimed in claim 256, wherein said charge accumulating device is a rechargeable battery.

266. The cardiac assist system as claimed in claim 256, wherein said discharge control device is a controllable switch.

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